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## PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

U. S. PATENT OFFICE

## Improvements in or relating to Mechanical Dolls

I, ONG LIU-HONG, a British subject, of 27, Soares Avenue, (2nd Floor), Kowloon, Hong Kong, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to mechanical dolls.

It is an object of the present invention to provide a mechanical doll having a head and arms which are movable by means of an actuating mechanism.

According to the present invention there is provided a mechanical doll having a movable head and movable arms, a manually operable actuator mounted on or in the body of the doll, which actuator is accessible from the back of the body, and mechanical means arranged within the doll to interconnect the actuator with the head and with the arms, the arrangement being such that movement of said actuator will effect rotary movement of the head and simultaneous swinging movement of the arms. Simultaneous swinging movement of the legs may also be effected.

Suitably, the mechanical interconnection between the various parts is so arranged that movement of the head can also be effected to cause swinging of the arms, and *vice versa*.

Embodiments of the invention will now be described by way of example, with reference to the accompanying diagrammatic drawings in which:—

Figure 1 is a side elevation of one form of mechanical doll of which the body is shown in outline and the legs are omitted;

Figure 2 is a rear view corresponding to Figure 1;

Figure 3 is a side elevation of an alternative form of mechanical doll of which the body is shown in outline and the legs are omitted;

Figure 4 is a rear view corresponding to Figure 3;

Figure 5 is a side elevation of a further

alternative form of mechanical doll of which the body is shown in outline; and,

Figure 6 is a rear elevation corresponding to Figure 5.

Referring to Figures 1 and 2, the mechanical doll comprises a body 10, a movable head 11 and movable arms 12, these parts being formed from a suitable plastics material. An actuator in the form of a rotary control knob 13 is arranged at the back of the body.

The head 11 is connected to the top end of an upright shaft 14 which carries at an intermediate point a bevel gear 15 which is in mesh with a pair of lateral gears 16. The lateral gears are mounted on short horizontal shafts 17 which are connected to the proximal ends 18 of the swingable arms 12. The upright shaft 14 engages at its lower end with a second bevel gear 19 which meshes with a drive gear 20 mounted on the inner end of a short horizontal operating shaft 21. The control knob 13 is hinged to the outer end of the operating shaft 21 and can be folded against the back of the doll body when not being used.

The various parts of the actuating mechanism may be formed from metal or from a suitably robust plastics material.

In use of the doll, the knob 13 is turned to effect rotary movement of the head 11 and, simultaneously, swinging movement of the arms 12, this swinging of the arms being in opposite senses. The control knob may even be rotated a number of times, whereby the head and arms will perform complete revolutions without damaging the mechanism.

In the alternative embodiment shown in Figures 3 and 4, the upright shaft 14 is rotated by means of a milled control wheel 22 secured directly thereto. A small segment of the control wheel extends outside the doll body and is actuable by means of the user's finger tips. In this case, the upright shaft extends downwardly and is journaled in an internal bearing 23 in the base of the doll body.

In the embodiments shown in Figures 1 to 4

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the upright shafts 14 are in the form of flat strips, as are the short lateral shafts 17 which engage in the arms 12, and the shafts engage in slots formed in the head or arms. Preferably also, the bevel gear assemblies are arranged as units, each unit comprising a casing within which the two or three gears are mounted.

It will be appreciated that the control wheel 22 and possibly also the knob 13 may not be visible, being covered by the doll's clothing. Also, the knob or wheel, particularly the latter, allows movement to be effected when the doll is held in one hand only, thus giving the illusion of automatic movement, the index finger being used to push the controlling wheel to the right or left.

In Figures 5 and 6 the arrangement is similar to that shown in Figures 1 and 2 but, in addition, swinging legs 24 are provided. The shaft 14 extends downwardly to bevel gear 25 which is secured thereto. The gear 25 meshes with a pair of lateral gears 26 which are mounted on the ends of short horizontal shafts 27 connected to the proximal ends of legs 24.

In this embodiment, turning of the knob 13 will effect simultaneous movements of the head, arms and legs, the arms and legs on each side moving in opposite senses as in a human walking action. It will be appreciated that in the specific construction shown, the legs and thus the head and arms, cannot perform a complete revolution, the extreme leg positions approximating to a straight line. It will also be appreciated that, as in the first two embodiments, movement of one of the parts will effect movement of the other parts; for example, turning of the head will effect swinging of the arms and legs.

In all the embodiments it is preferred that the gear arrangements comprise units which may be replaceable. Referring to Figures 5 and 6, gears 15 and 16, gears 19 and 20, and gears 25 and 26 are arranged as units having casings 28. The casings have flanges 29 which extend forwardly and rearwardly to engage in sockets 30 which are secured to the front and rear of the somewhat flexible doll body.

#### WHAT I CLAIM IS:—

1. A mechanical doll having a movable head and movable arms, a manually operable actuator mounted on or in the body of the doll, which actuator is accessible from the back of the body, and mechanical means arranged within the doll to interconnect the actuator with the head and with the arms, the

arrangement being such that movement of said actuator will effect rotary movement of the head and simultaneous swinging movement of the arms.

2. A mechanical doll as claimed in claim 1, in which the mechanical interconnection between the movable parts is so arranged that movement of one of said parts will cause movement of the other parts.

3. A mechanical doll as claimed in claim 1, in which said head is connected to the top of an upright shaft which is rotatable by means of said actuator.

4. A mechanical doll as claimed in claim 3, in which said actuator comprises a rotary control knob connected through bevel gearing with said upright shaft.

5. A mechanical doll as claimed in claim 3, in which said actuator comprises a rotary control wheel secured to said upright shaft to rotate therewith.

6. A mechanical doll as claimed in any of claims 3, 4 or 5, in which said shaft is connected through bevel gearing to a pair of shafts which are connected to the proximal ends of the arms.

7. A mechanical doll as claimed in any preceding claim, in which movable legs are also provided and second mechanical means are arranged to interconnect said actuator with the legs, so that rotary movement of the actuator will effect rotary movement of the head and simultaneous swinging movement of the arms and legs.

8. A mechanical doll as claimed in any preceding claim, in which said mechanical means comprises at least one set of bevel gears arranged as a unit.

9. A mechanical doll as claimed in claim 8, in which the or each unit is provided with flanges which engage as spigots and sockets with members secured to the doll's body.

10. A mechanical doll as claimed in claim 7 as dependent on any of claims 3 to 6, in which said upright shaft is connected through bevel gearing to a pair of shafts which are connected to the proximal ends of said legs.

11. A mechanical doll constructed, arranged and adapted to operate substantially as hereinbefore described with reference to Figures 1 and 2, Figures 3 and 4, or Figures 5 and 6 of the accompanying drawings.

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Chartered Patent Agents,  
Agents for the Applicant.

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3 SHEETS

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Sheet 1

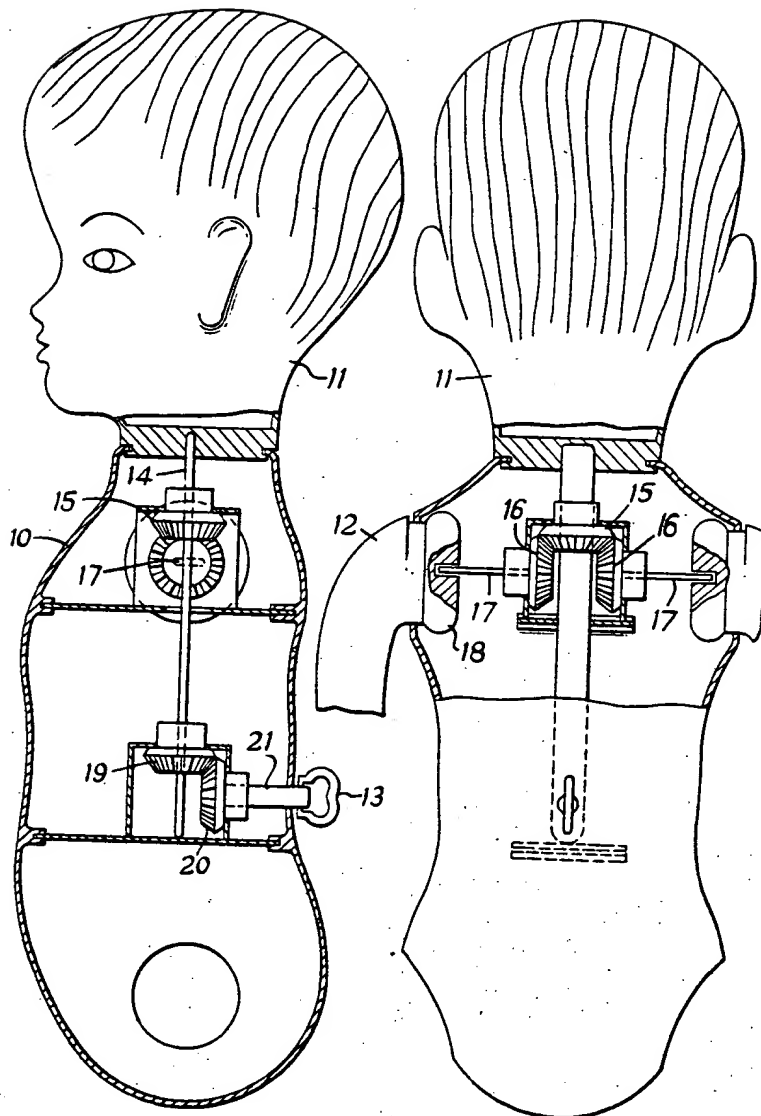


Fig. 1.

Fig. 2.

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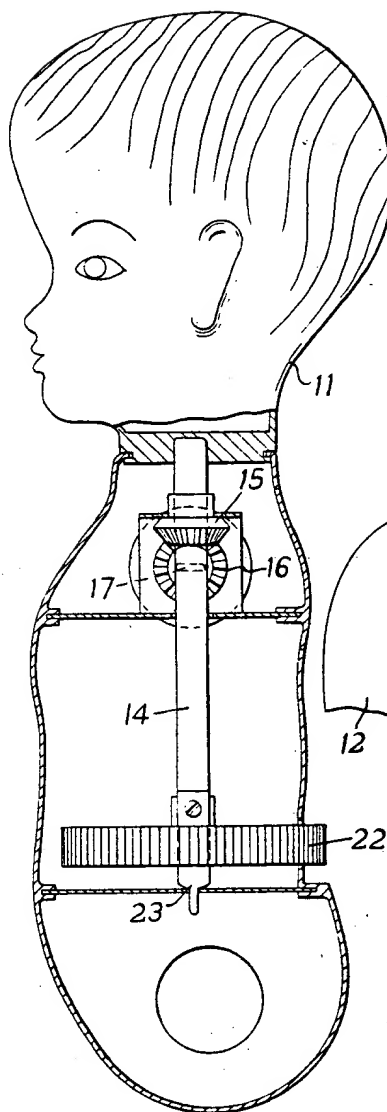


Fig. 3.

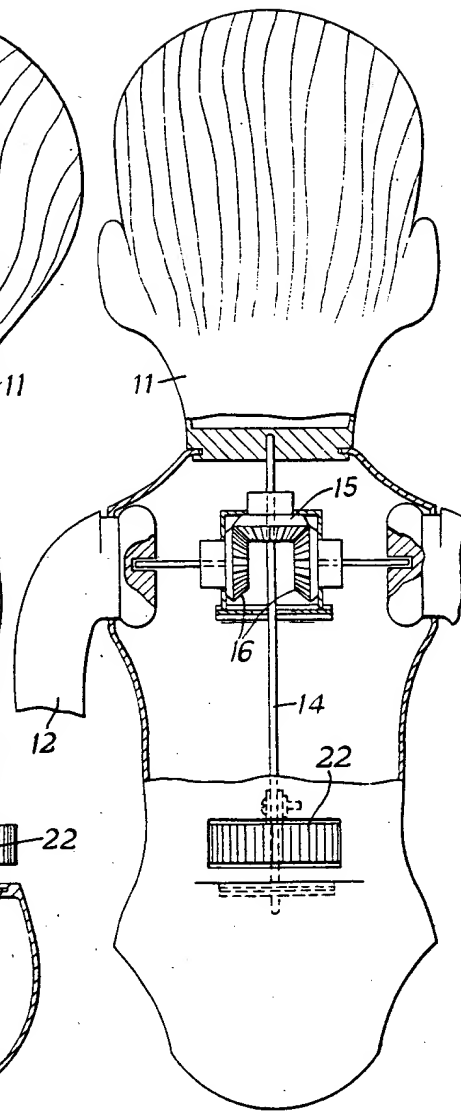


Fig. 4.

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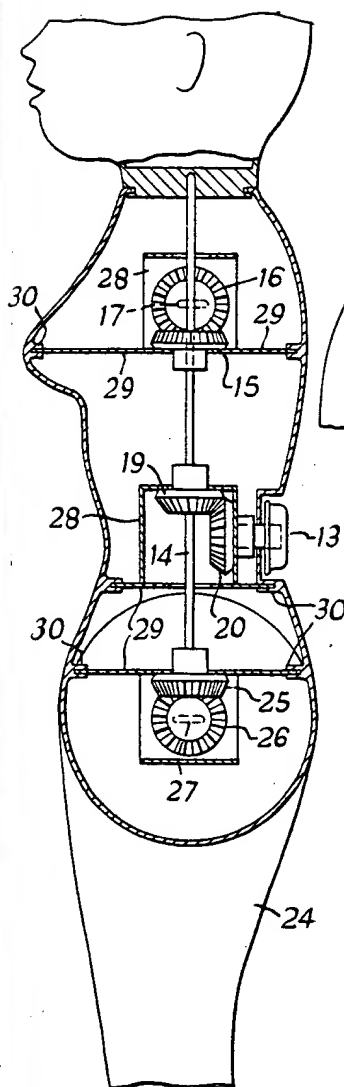


Fig. 5.

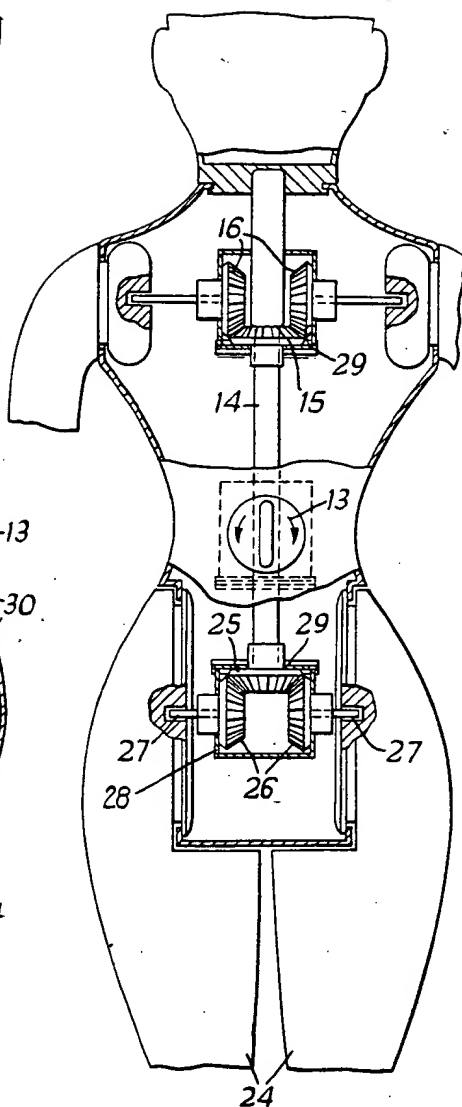


Fig. 6.

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